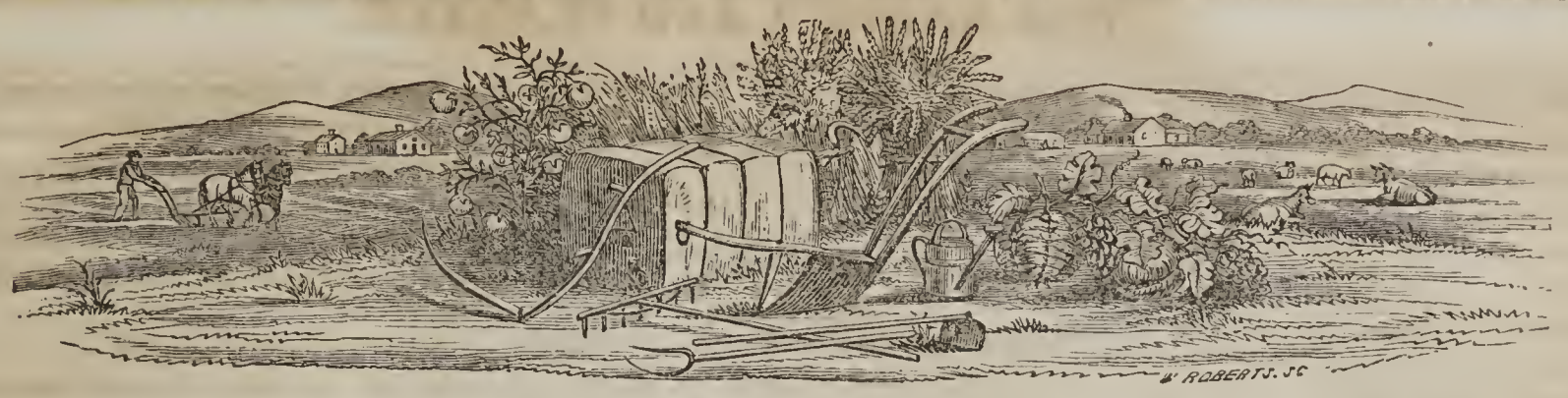

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ADDRESS

Of the Hon. R. F. Simpson, Delivered before the Pendleton Farmers' Society, at its Anniversary Meeting, held October 10, 1850.

GENTLEMEN:—

According to a time honored custom, I arise to address you, and to add my mite to advance the objects of our Society.

In doing this, I am conscious I would make but a poor offering were I to give you the result of my own experience, or the lights derived from that experience.

I feel it a duty, if I trespass upon your time and attention at all, to give you something more valuable.

I propose, therfore, to give you a review, in a condensed form, of the opinions of A. Petzholdt, a chemist of considerable research in the subject of Agricultural Chemistry.

In this I desire to be understood as claiming no originality, except in the arrangement of the different heads of which he treats. I have selected this work because his writings are more easily understood—because some of his opinions differ widely from those now generally received among us—and believing that, by bringing to the notice of this Society, opinions differing from those generally entertained, it may have a tendency to elicit enquiry and investigation: and if it be ascertained that they are founded in truth, lead to improvement. It is gratifying to know that all the opinions of Petzholdt, are sustained by Leibig and Bousingault.

Truth should be the aim of all our enquiries. And a candid mind will follow it wherever it may lead. And to understand the principles in Nature by which plants grow to maturity must be greatly important to the Cultivator.

I am aware that to address an audience, even of Farmers, on so technical a science as agricultural Chemistry, I shall find it difficult to make myself either interesting or easily understood. I trust, however, that the subject will, of itself, excite sufficient interest for the short time I may tax your patience.

It is matter of history that for many, I may say thousands of years, Agriculture has been practised, and successfully too, without the benefit of science. But we must remember, says Petzholdt, that Agriculture has from early ages been practised as an Art. Pursuing it as an Art, innumerable experiments have formed an accumulation of experience, from which rules have been made that have been practised upon successfully.

In general, an Art is that which depends on practice; and science, that which depends on speculative principles. Cultivators of the soil discovered and for a long time have known by practice the advantages of fallow, the rotation of crops, and manuring. Altho' this has been known and practised for a thousand years, yet cultivators now practise, just as others did at the beginning, notwithstanding the existence of many acknowledged defects. People seeing these defects, and attempting to improve them without any knowledge but empyrical experience, have failed. The sacrifice of time, labor, and capital consequent on the failures, have caused all deviations from the beaten path to be looked upon with distrust.—Theories have been formed without the knowledge of the general principles of science. The consequent failures have made Agriculturists regard it as a matter of course, that a farm, conducted on theoretic principles, will yield less produce than the same would under the management of a practical farmer. But science begins to prove its value. A knowledge of the elements of plants—also a knowledge of the elements contained in the earth, air, and water from which plants draw their sustenance, is *the* science.

By an "element," Chemists mean that part of any compound substance, which, remains after being divided and re-divided until the sub-division can be carried no farther.

But Agriculture as an Art has probably reached its highest limit. Nothing farther, says Petzholdt, remains to be done. To improve, a resort must be had to science, from necessity. And the accumulations of the experience of ages, furnishes a sure foundation for the science. For a science to be useful, it must not contradict well established experience. And when practically applied must yield greater results. Further—Petzholdt says that the cultivation of plants produces an abnormal, or unnatural state, in which is exhibited a constant tendency to go back to their natural state, and therefore require constant cultivation, as well as procuring seed from the better product now and then, to keep them from going back.

Excessive fat on animals, is the abnormal state produced by the breeder, if left to their own feed they will go back to the natural state. In this respect cattle breeding is exactly parallel to raising of plants.

If we wish to enquire into the cause of this difference between plants in their wild and in the cultivated state, we are led at once to the inequality in the nutritive matters which furnish a supply to plants in the wild and cultivated state. We see that plants in the wild state, evidently enjoy the same air, light, and heat that cultivated plants do; consequently, the soil and the soil only, is the cause of the difference.

For the purpose of cultivation, then, we must have a knowledge of the constituents of the soil, as well as of the plants we cultivate.

We want to know what the plants we grow feed on, and where they get the food And when the soil is deficient in this food how we may supply it. Here chemistry comes in to our aid, and gives us this knowledge.

By analysing the plants usually cultivated, it is found they contain, taking the whole plant and seed together, 16 elements.

This author makes it clear, I think, that no element is originated or produced in the plant, during the process of growing. Consequently all they do contain must be derived from the earth, air, or water. Of these 16 elements which are found in plants, 4 belong to the air, and 12 to the earth. The 4 from the air, are oxygen, nitrogen, carbon and ammonia. The 12 elements belonging to the earth are, sulpher, phosphorus, potassium, sodium, calcium, magnesium, iron, manganese and silica. The other three, chlorine, iodine and bromine, are taken up by marine plants only. Of these 9 elements which our cultivated plants take from the earth—the different plants take them up in various proportions—some taking more of one element and others taking more of another. And so correctly have they ascertained by burning the plants and analysing their ashes, what elements they have drawn from the earth, that chemists have arranged the whole of them in three classes, calling them silica plants, lime plants and potass plants. And Leibig has arranged different plants under the different classes thus:

SILICA PLANTS.

Oat straw and seed contains in its ashes, 62 parts of silica out of 100.
Wheat straw contains in its ashes, 61 parts of silica out of 100.
Barley straw and seed contains in its ashes, 55 parts of silica out of 100.
Rye straw contains in its ashes, 63 parts of silica out of 100.
Hay contains in its ashes, 60 parts of silica out of 100.

LIME PLANTS.

Tobacco contains in its ashes, 67 parts lime out of 100.
Pea straw or vines contains in its ashes, 63 parts lime out of 100.
Potato vines contains in its ashes, 59 parts lime out of 100.
Meadow clover contains in its ashes, 56 parts lime out of 100.

POTASS PLANTS.

Corn-stalks in its ashes, contain 72 potass and soda, 6 lime and 18 silica.
Turnip in its ashes, contains 72 potass and soda, 18 lime.
Beet root in its ashes, contains 88 potass and soda, 12 lime.
Potato (the root) in its ashes, contains 85 potass and soda, 14 lime.
Jerusalem Artichoke in its ashes, contains 84 potass and soda, 15 lime.

This classification at once indicates that for a plant that feeds mostly on lime, there must be lime in the soil. The silica plants must have silica, and so of the potassa plants.

Now, says Petzholdt, this is precisely the object of manuring. That is, to supply the soil with the particular element the plant you wish to grow feeds upon. It is the knowledge of these facts, too, which indicates the propriety and use of rotation in crops.

And to give us a clearer understanding from what source the different plants draw the elements which compose them, he shows what the air, earth and water are composed of, and how they serve to furnish food for plants.

100 volumes of air is composed of:

21 parts of oxygen.
79 nitrogen, with small quantities of carbonic acid, ammonia and water.

Carbonic acid, ammonia and water, are found in air every where, about 4 volumes of carbonic acid to 10.000 volumes of air.

100 volumes of water is composed of:

33 vol. oxygen.
29 nitrogen.

Water has two distinct properties—that is to dissolve and to absorbe. It will *dissolve* various gases liquid and solid substances. And when dissolved they impart to the water their various properties.

It will *absorb* carbonic acid, ammonia and nitrogen from the air. The lower the temperature the more of gases it will absorb. The higher the temperature the more of solids it will absorb.

Soil that is fertile is composed of the 9 elements named above consisting of several mineral substances more or less pulverized—various saline matters soluble in water, with some silica in a soluble condition; and also organic vegetable matter decomposed, or humus. These are termed inorganic, because they derive their origin from the degradation of rocks.

By this explanation of the element contained in the earth, air, and water—and the analysis of plants, it is shown that no plant has any ingredient which is not contained in the earth, air, or water.—and if it were not proven, it would be fair to presume that they get all they possess from them.

If, then, the analysis of plants and of soil does show that no plant which grows from the earth, contains any ingredient which is not also found in the earth, air, or water—and that no element is produced, or created in the plant by the process of its growth—it would seem reasonably clear, that chemists have already attained to the first branch of the enquiry—to wit: what it is that plants feed on, and where they get it—that is, whether from the earth or air.

The next important inquiry is—how can we, when our soil is exhausted, resupply it with the necessary elements as food for plants?

Our author says, to do this there are but two modes, to wit:—by manure and degradation. By degradation, he means a chemical dissolving of rocks, by the action of the elements of the air and water, into soil. To show this, he has given a full explanation how nature's laws act to renew exhausted soils, as well as to form new soils.

First, he says all the elements which go to make up the earth, air and water, (and which are now ascertained to be 56 in number) are divided into two great classes of compound substances to wit:—acids and alkalies—acids, so called because of a sour taste—alkalies, so called because when chemically united with an acid, they form a new kind of compound called salts—of which the alkali is the base—that is, the principal part.

Rocks are all composed of these elements in different component parts.—Granite, for instance, is composed of one simple and two compounds, to wit:—quartz, mica, and feldspar.

Quartz is pure silicic acid, which cannot be tasted, however, because saliva will not dissolve it.

Mica is a compound of silicate of alumina, persilicate of iron and silicate of potassa.

Feldspar is composed of silicate of potassa and silicate of allumina.

When these acids and alkalies are brought in contact, and water is present, an immediete and mutnal strife commences at decomposing each other—never ceasing except when dry—and ending in the more or less complete annihilation of their compound properties. By which new compounds are formed, in which the original characteristic properties of either are no longer perceived. And what is particularly remarkable, all these new compounds are rendered soluble in water. This strife, by our author, is called antagonism—but by other chemists, and I think more correctly, the action of chemical affinity.

It is important to observe that water is a necessary ally to carry on this action. A piece of granite kept in a perfectly dry state will remain undegradated for ages.

The action of these elements on granite are thus explained, and is an example how the elements act on other rocks:

The carbonic acid in the air and water unites with the potassa, which is the base of the silicate of potassa in mica, forming a new compound called carbonate of potassa. This is soluble in water and thus degradates the mica, letting loose the alumina and iron, the other compounds of mica. Carbonic acid also unites with the potassa of feldspar (another componient of granite) forming another carbonate which is thus rendered soluble. This degredates the feldspar.

But you will remember that silicate of alumina is a component of both mica and feldspar. This is not acted on by carbonic acid, but remains undissolved and is common clay, and when very pure is porcelain clay.

Now this strife, (call it either antagonism or affinity,) is perpetually going on between the elements in the earth, air and water, under the laws of their nature, and is *the* process by which God turns rocks into soil. And by this means spreads over the surface of the Globe a soil, rich with food, particularly adapted to the growth of plants of all the varied kinds. And not only furnishes a new soil for man to begin with, but is constantly in action to supply the waste which an improvident growth of plants produces.

I will not stop here to admire and portray the unbounded wisdom and singular benevolence, which are displayed by an examination into the laws by which God furnishes sustenance for man. But will at once proceed with the design.

This chemical action of the elements is constantly going on, as well in winter as in summer, furnishing fresh soluble food for crops; and is therefore considered by our author as one of the means by which the exhausted salts in our land may be re-supplied. And to show how we may facilitate degradation, is one of the important aids science has brought to agriculture.

Our author has thus far shown how fertile soil is made—what food it supplies to plants—and of that food, what each plant we grow takes up to make it grow.

I will now proceed to show how he says fallow and rotation of crops delays exhaustion, and then how, by facilitating degradation and by manure, exhausted soils may be renewed.

Before I proceed, however, as our Author makes frequent use of the terms element and degradation, let me repeat that you be sure to have a distinct recollection of their meaning.

An element means that unit which remains after separating, and re-separating a compound, until but one thing remains, and that one no further divisable. That is an element.

By degradation, is meant, the chemical action of these elements on one another, being composed partly of acids and partly of alkalies, whereby rocks and minerals are dissolved and turned into soil.

After the rocks and minerals are turned into soil, plants take these elements, then reduced to a soluble condition, into their roots. That portion of the plants that dies and decays, gives back again to the earth what it has taken from it.—That part that is eaten by animals, which does not go to sustain the bones and flesh of the animal, is cast out and goes back to the earth. And if one animal is eaten by another, the elements which compose its flesh are only delayed in getting back to the earth. Finally, the animal that ate the other, is himself reduced to earth. In this round no one element is ever lost.—When in plants or animal they are in a condition for food, and when returned to the earth they at once are at work to prepare the soil to give more food to plants.

Our author says that all plants take up from the earth, a portion of each one of the 9 elements mentioned as being found in plants. They are therefore all exhausters. Some more, however, than others, as has been before explained, consequently, a succession of crops of any kind, will in time exhaust the soil. This result has been seen for ages. And long ago it was discovered that the land that was allowed to rest, or lie fallow, which means rest, was so restored as to produce a better crop than it did when the cultivation was stopped. Hence the practice, of long standing among farmers, of letting their fields lie fallow, or at rest, that they may recover their fertility. Petzholdt says this recovered fertility is mainly owing to degradation. And hence the necessity of knowing how it is that by degradation, the soil is renewed, in order that we may understand how to assist nature in this important operation, or at least, may avoid throwing obstacles in nature's way, by our blundering.

The soil may not only become exhausted of its salts by repeated crops, but it may become, in its mechanical condition, unfit for the growth of plants. Both of these must be attended to, and when in this condition it requires preparation and amelioration before it can grow plants to advantage. Clay contributes nothing to the growth of plants, but it is of great service in giving this mechanical support to plants, and being the medium to transmit the salts and water essential to their growth.

This mechanical condition of the clay is best restored by rest, and may be improved by plowing. Fallow, therefore, will restore, not only the mechanical condition of the soil, but will, by degradation, restore the exhausted elements.

I have had occasion to show how rocks and minerals are turned into soil. This process, going on at all times, is not confined to large rocks, but proceeds continually upon the smallest, as well as the largest disintegrated particles.

In all arable soils amongst the mineral matters which constitute the great mass, there invariably exists portions still undergoing decomposition. Thus by this means soil that has become poor and unfit to grow some plants, may, by merely lying fallow, become capable of growing again the same plant. And if this renewing of the soil by degradation, (which is going on as well while the crop is growing as in the winter) should go on as rapidly as the crops grown on it exhaust it—then it is clear that it would never be exhausted. This, however, is not known to exist in any soil in Europe.—Bausingault says, in Sicily wheat has been grown for 200 years successively. Which would go to show either a more than ordinary supply of food for wheat originally, or a reproduction of it by degradation.

But if the annual removal of these elements by the growing crops, exceed the annual reproduction by degredation, decreased fertility, and finally, complete exhaustion must ensue. And as it has been fully ascertained that some plants draw from the earth more than others, it depends upon what plant you grow how soon the exhaustion may be complete.—This goes to show that the rest of land, or fallow, bears no resemblance to the repose of a wearied animal.

By understanding the true use of fallow, you are not only prepared to know when any field requires it, but you are enabled to discover the means by which the period of non-cultivation may be shortened, or, possibly, avoided altogether.

If we are assured that the benefit derived from fallow depends on the progress made in the decomposition of the soil, it is evident that to accelerate degradation, is to shorten the period of fallow.

It is known to chemical experience that this action of the atmospheric elements, to wit: oxygen and carbonic acid, on the minerals of the soil, by which they are made soluble, proceeds the more rapidly the larger the surface the soil acted on offers. We see at once, then, that by plowing, the extent of surface is increased—the action of the elements on each other more rapid—and consequently, the period of fallow shortened.

(To be continued.)

Report on the Dairy Business.

We feel it our duty, as well as inclination, to comply with the call made upon us for information in relation to so interesting a subject, as that of Stock and Dairy Farming at the South. We have given some attention to this subject, with a view to engage in it, and have satisfied our own minds that, as an avocation, there is none more agreeable or interesting; and in point of profit, will compare favorably, with the most successful branches of Southern Agriculture.

Having occasion frequently to visit that mountainous portion of North Carolina, comprising her North Western counties, our attention was, years ago, forcibly attracted to the great luxuriance of their meadows. Fifteen years since on our first visit to this region, there were but few meadows, and those mostly small patches.—Since that time they have been gradually extended, and uniformily with the most favorable results. In every instance where we have made the enquiry, the proprietor has considered the meadow the most profitable part of his farm.

The principal grass cultivated is that known by the name of Herd's grass in the Southern States, and Red-top at the North. This grass first sown on wet and swampy lands, has since been extended to the hill sides with great success. More recently, the Timothy, Clover, Orchard and Oat grasses have been introduced, with decided success.

Witnessing these results, and being the owner of a body of land lying in the counties of Macon and Haywood, covering some of the highest table lands on the mountain range, which we believed well adapted to the grasses, we opened a correspondence with a practical dairyman of the Western part of New York; by means of this correspondence we are in some degree enabled to compare the advantages of our locality, with one in which the business is extensively carried on. The information thus derived induced us to embark in the enterprise, and we have associated with us as a partner, a highly intelligent young man from Vermont (reared in this branch of husbandry) to conduct it; and have, since last November, been engaged in clearing and preparing the land to be set in grass, and expect during the present fall and ensuing spring, to be able to set eigbty acres in grass.

Our place known as Fairfield Farm, is situated in Fairfield Valley, in Macon county, North Carolina. It lies to the east and just under the crest of the Blue Ridge, and is surrounded by peaks rising from 1000 to 1500 feet above the valley, with an opening to the South through which the Toxoway, a stream which takes its rise in the valley, is discharged. The valley is elevated about 4000 feet above the Atlantic.

The waters of the Tugaloo and the Seneca, both emptying into the Atlantic—the French Broad and the Tennessee discharging, into the Gulf, take their rise in this vicinity, and diverge to every point of the compass; and it is probable that here is to be found the highest table land on the mountain chain.

The climate is remarkable for the coolness of the atmosphere and the frequency of showers during summer. Fires are comfortable at night through the summer months, and a drought seriously affecting the crops, is of very rare occurrence; we have uniformily remarked the drier the summer the better the crop of corn.

The soil is a sandy loam, formed by the disintegration of the gneiss, which is the prevailing rock of the country.

The forests on bottom lands consist of Laurel, White and Spruce pine, White and other varieties of Oak, Maple, Gum, &c., &c. On cove lands, Oak, Hickory, Poplar, &c., &c. On the ridge lands Chesnut, Chesnut Oak, Oak, &c., &c.

Grasses, Oats, Rye, Buck Wheat, Potatoes, Turnips, Beats, Carrots and Cabbage grow to great perfection. The Southern varieties of Corn will not mature; a small variety of yellow Corn is mostly cultivated, which in dry and warm summers gives a remunerating return. We are of opinion that by a liberal application of heating manure, that abundant crops of this variety of Corn might be produced.

The county adjacent to our farm is but sparsely settled, and mostly by those who pay but little attention to agriculture. It affords many highly eligible situations for extensive stock and dairy farms.

Fairfield Farm is situated 59 miles N. of Anderson C. H., to which place a rail road will be completed in a short time. From thence to the base of the mountains, a distance of 44 miles, the road is good, the remaining distance of 25 miles is through the mountains, over a road badly made and kept up by a sparse mountain population. It is however practicable to lay out a good road over the Blue ridge to the valley of the Tuckaseegee, to connect with a road, chartered by N. Carolina, and to be built by the State through her North Western counties to the Georgia line. It is probable that chartered companies may, during the ensuing year, commence the construction of the road over the Blue Ridge, which, when completed, will greatly increase the trade to Anderson, besides making accessible to that portion of our Southern people who leave their homes during the summer months a country, which for health and the magnificence of its scenery, is not surpassed by any portion of the United States.

The advantages of this region over the great dairy country of New York consist.

1st. In the greater length of the grazing season The grasses are in sufficient state of forwardness for full grazing by the first of April, (last spring grass was three inches high on the 15th March,) and will continue until the last of November, besides affording considerable grazing every open spell of weather through the winter, whilst in New York grazing usually commences 1st of May and continues till 1st November, giving full two months advantage in length of grazing season in favor of this county; here also rye sown in August, affords considerable grazing during winter, whilst in New York, it would be killed by the cold.

2. In the abundance of showers keeping the grass in a growing and luxuriant condition throughout the summer; whilst in New York, it is frequently in a parched condition.

3. In the cheapness of land, which may be purchased, already cleared, set in grass, and the necessary improvements in buildings made, for less than one half that farms of similar quality would cost in New York.

4. In the vast extent of mountain range, on which the stock become quite fat during summer and fall. We would also remark here that on the elevated plains and ridges with a good soil and a Northern inclination, there is a grass, called by the mountaineers winter grass, which remains green during winter. The last winter we drove 30 head of our stock to this grass some miles from my farm, and they remained out the entire winter, with the exception of two weeks whilst snow was on the ground. They all came safely through the winter, and in better condition than those we brought to our farm near this place and wintered.

6. In the greater coolness of the summers as compared with those of New York. We have seen butter, without extraordinary pains, kept perfectly sweet for twelve months.

The disadvantages of this country consist of the difficulty of access from the badness of the roads, the want of society, schools, and churches;

these obstacles, however, might be easily overcome by the united energy of a few enterprising persons.

Through a correspondence with several New York dairymen, we are placed in possession of the following facts, viz:

That on a well conducted dairy establishment, cows on full grass will average four gallons of milk per day; that two and a half gallons in spring, and two gallons in fall, will make one pound of butter; that one gallon will make one pound of cheese.

That the average cost of wintering cows is seven dollars per head.

That it requires from one to two acres in grass for each cow during summer, and one acre in meadow to furnish the necessary hay to each cow for winter.

That the average product in hay, is one and a half tons per acre.

That farms sell from twenty to sixty dollars per acre, and choice farms in choice localities sell for one hundred dollars per acre.

That one hand will attend to ten milch cows, and produce the necessary provender to winter them, and also other necessary stock for farm purposes.

That the large amount of offal resulting from converting milk into butter and cheese, enables the farmer to produce an amount of pork beyond what is required for consumption.

There is one fact in favor of grass, over cotton and corn farms, of vast importance, to which we beg leave to advert. It consists in this, that the grass farm not being subject to wash from rains, with but little care is constantly growing better, whilst the corn farm from its great liability to wash, without extraordinary care, is constantly being impoverished.

In view of the great political events which agitate our country, threatening a severance of the Southern from the Northern States, it becomes a matter of vast importance to diversify our pursuits, and make ourselves, as far as possible independent of those who have degraded and seek to destroy us.

Our cities are almost wholly dependent upon the North for the production of the dairy, as also many other things which we could produce with great facility.

Rail roads now being built will very soon reach Anderson and Greenville, furnishing cheap and rapid transportation, and it is time that we should put forth our energies in the new fields of enterprise, which are being opened to us.

Very many of our wealthy citizens who have been in the habit of visiting the North in search of health and pleasure during the summer, disgusted with the insolence and fanaticism of the Northern people, are looking to our own mountain region, as a place of resort; several of whom having visited the upper part of our district, and that portion of North Carolina which we have described, have pronounced it unsurpassed in the purity of its atmosphere and grandeur of its scenery, by any portion of the United States, and will, as soon as it is made accessible, spend their summers and their money amongst their friends.

We have, Mr. President, discharged the duty assigned us, to the best of our ability. We have given such facts as have come to our knowledge by observation, and such other information as we believe proceeded from a reliable source, and have made such deductions therefrom as we felt warranted in doing. We shall not venture an opinion as to what profit might be realised from this branch of husbandry, but feel satisfied that it would be much greater in favorable localities in the southern mountains, than in more northern latitudes.

All of which is respectfully submitted.

WILLIAM SLOAN, Ch'mn.

Raising Pork.

As many farmers have lost corn, some by freshet and some by drought, I beg leave to offer a few remarks on the subject of raising pork.

A few years since I had a small stock of hogs of the common breed of the country—a sow, and eight pigs just cleverly weaned. Sometime in November I put them on a stated allowance.—For each hog there was taken from the crib daily, one pint of shelled corn, which was put in soak during the day and in the evening boiled. This was fed away the next day—one half in the morning the other in the evening. This plan was pursued till the next October, and on the day we were turning them into the pea-field, one of an average size was taken and weighed, and it was ascertained—corn being that year worth forty cents per bushel—that each hundred weight gross of my pork had cost me one dollar and seventy-five cents. I had fed away more than that money's value of corn on each hog—but then my hogs weighed much more than one hundred pounds.

Perhaps some farmer will exclaim—here is a great deal of trouble, and there is such a thing as "paying too dear for one's whistle." That the reader may judge of this for himself, I will state, as briefly as possible, my fixtures and method of feeding. A common iron pot, such as washer-women use at the branch, was set up on a few rocks, the interstices of which were filled with clay-mortar. Around this boiler was put up a small pen, one rail square, and the rails well notched down, to secure the fire from the wind. Four small posts with crotches set up, one in each corner of the pen enabled us to place boards over-head, which made shelter quite sufficient for such a purpose. All this was done by common farm hands, and was the work of but a few hours.

Such were my fixtures, and now for my method of cooking and feeding. *It was made the business of* the man who took out the horse-feed in the morning, to take out at the same time the allowance for the hogs. The corn was emptied into the boiler with water enough to cover it completely, and there it remained in soak through the day. In the evening it was *made the business of a little boy*, after driving up the cows, to make a fire under the pot, and he was required to remain 'til the water boiled and then he went away. The next morning the corn was taken from the boiler by hand—the acid slop being left—partly to save the carrying of water, and partly that the mess for the next day, might be soured as speedily as possible. If the hogs be fed in a trough or on the ground with corn in the ear, the more powerful animals make war on the weaker ones, the food is eaten hurriedly by all and is imperfectly masticated--much of it is bolted without being chewed at all; and the more hungry the animals, the more certainly will all of this take place. To avoid all this loss, the boiled corn was taken to the pasture near by, and was broadcasted on the surface of the grass—a method of feeding which placed each hog on an equality, and enabled each to get his fair share. Nor was this all—every grain had to be picked up separately—the mouth, consequently, could not be gorged—and this way of feeding may be recommended as an infallible preventive for bolting. Indeed, by boiling and soaking, the corn becomes so tender and so distended, that it is scarcely possible for a single grain to escape the tooth of the feeder, and the farmer may be assured that every particle of nourishment in the food, has been transferred to his hog.

Here then, Messrs. Editors, was an actual experiment—something which has been done—something which every farmer may do—and having made a statement of my fixtures, my way of cooking and feeding, and the cost of pork per hundred, I leave it to you to say whether I have "paid too dear for my whistle."

And what think you, reader, is the gain in the weight and bulk of corn by this plan of soaking and boiling? Make the experiment for yourself, I beg you, and you will find that every bushel treated in this way, will gain about fifty pounds in weight, and what went into the boiler as one bushel will the next morning measure very nearly two and a half bushels. But to obtain this result, it is indispensable that there be a plenty of water both when soaking and when boiling.

It is required of a witness that he tell not only the truth but the whole truth, and acting on this principle, I proceed to say that my hogs were debarred advantages which they are in the habit of enjoying almost every where else. I have no interior fences on my farm separating the small grain from the corn, and consequently, not only my hogs, but every species of stock is totally excluded from my stubbles. Neither did they have the benefit of the rich slops thrown out by the cook and washer—for the housewife protested that if they were admitted to the kitchen yard, they *would be the death of every chicken*. Nor did they have the use of the horse-lot and stables—the horseboys declaring that if admitted there, *the fleas would be the death of them*. I weakly yielded to this popular clamour, and my hogs were limited to a poor range and their slop corn.

There was another disadvantage which I disregarded at that time, but to which I attach great importance now. My hogs were without shelter, and lay in the woods, exposed to frost and rain. And here I shall be met at the threshhold by a phalanx of farmers, and shall hear that hogs will not "do well" if sheltered, and shall be told by way of proof, that whenever permitted to sleep under a house they become mangy, and diseased. Now, if it were an established fact, that the shelter is the cause of these ailments, there would be nothing more to be said—but that is precisely the point about which we may be well entitled to have our doubts. Is it not acknowledged by every farmer, that cows, sheep, horses and mules are the better for being protected? and if so why not the hog? Like them hogs have hot blood, and in their anatomical structure and the processes of respiration and digestion, they are precisely similar. The analogy then is altogether in favor of their being sheltered. If we appeal to their instinct, the answer is exactly the same. When left to themselves they select with unerring sagacity, the warmest spot on the farm for a bed. Besides, only look at them if you please, when turning in for the night in a cold spell—why they are perfect *connoisseurs* in the art of *snugging up*, and laying aside all the animosities, jarrings and violations of courtesy manifested at feeding time, they unite with one consent to make each other comfortable.

It is the habit of this animal when he finds good quarters, to return to them at night with the ut-

most punctuality; and it is also their practice to turn up the earth with their snout before going to rest. Now when all this goes on for months, and under a house too, a spot from which the rain has been exeluded for years, the effect is, to reduce the soil about them to what apotheearies call an *impalpable powder*, which is set in motion not only by the slightest movement, but by the very breathing of the animals themselves.—When once afloat, it insinuates itself into the pores of the hog's skin, and finds its way in large quantities into his lungs, and it may be confidently affirmed that it is not the shelter, but this levigated dust, which is the cause of all the diseases incident to these animals when occupying shelters with ground floors. If these views be eorrect it is indispensable when making shelter for hogs to have it so floored with plank or poles as to exclude them entirely from the ground.

In providing a proper shelter for such valuable stock, the farmer will minister not only to the growth and eomfort of the animal but to his own feelings of humanity and his own profit. In Leibig's work on animal chemistry the principle is laid down and illustrated that with man warm clothing is to a certain extent a compensation for food, and that what clothing is to the human species, good shelter is to the animal creation. I merely glance at his argument and do not feel competent to give an abstraet, but eontent myself with referring to the book itself. But if the principles laid down by him on this point be correet and we have not seen them eontroverted, the farmer may be assured of this—that as long as his hogs are exposed to the frosts, the sleets, the snows and the merciless rains of winter, all those portions of his feed, which if sheltered would *go to form fat*, are wholly expended in *forming heat* to enable the animal to resist the external cold. To this extent the food given is a total loss to the farmer, and if this be so, a good shelter would be equivalent to a saving of so many bushels of corn. In a eountry like this, therefore, where logs are plentiful and corn scarce the farmer who neglects to provide protection for a stock that contributes so much to his daily eomfort, is guilty of the most miserable economy imaginable. If on this point I have trespassed on the patience of the reader I truly crave his pardon, my sole apology is this, I have neither seen nor heard of any individual in these latitudes who has ever made a shelter *expressly* for his hogs. I hope there may be many sueh, but if so their example has not been contagious.

In eonclusion I recommend earnestly this plan of soaking and boiling corn for hogs. The saving is great, very great, and if the farmer will proeure a thrifty breed of hogs, provide a proper shelter, give them access to his stables, pea-fields, stubbles and kitehen slops, and in addition one pint of corn per day, boiled, we are warranted in saying that they will never take a backset, but will grow and thrive uninterruptedly. At the end of fifteen months they will be fit for bacon, and thus the cost and risk of keeping them till two years old and over will be avoided. I am confident if our farmers were to combine a system of saving their manure with the plan of feeding above described, that Kentucky pork might be expelled from this portion of our land.

In my estimate I designedly said nothing about the cost of keeping the hog previous to weaning, because I consider the manure that he furnishes is mueh more than an equivalent for that expense. "The Old Farmer."

Pendleton, Oct. 20, 1850.

Moles and Rats.

Messrs. Editors:—I have coneluded to drop you a line to put your enquiring correspondent, R., on a plan to get rid of moles, and to keep rats out of his oats.—It may also, possibly, be of some use to others. If the *Palma Christi* seed be put into the mole roads in the winter, or spring, when these pests can find nothing else to subsist on, they will eat it, and it will kill them. I have been troubled very much with moles myself, and in this way have got rid of them. If R. will plant the seed about his potato patch and cultivate the plant, he will have no moles.

To keep rats out of oats, is very easy; if, when you put your oats in the house, you throw down two layers of oats, then sprinkle ashes over them, then lay on two more layers and put on ashes again, &c., using about one bushel of ashes to every thirty dozen oats. Spartanburg.

Glenn Springs, Sept. 25, 1850.

Horticultural Department.

Fruit Culture.

Messrs. Editors:—I avail myself of the invitation you politely extended in your last paper to contributors, as well as to pass an idle hour, in inditing a short article on the culture of fruit, which if it prove acceptable, and of any service to your readers, you are at liberty to publish.

There is probably no region of country within the United States where Apples, Pears and Peaches can be more easily and successfully cultivated, than in the mountain counties of North and South Carolina and Georgia. I have thus far not succeeded very well in raising Cherries, more especially the Bigarreau and Heart Cherries—the bark of the trunk being liable to split, from the effect of the heat of the sun, or some other cause. Thus far, I have been unable to find a remedy for the disease; splitting the bark, peeling of the cuticle, white-washing, or sheding, appears not to remedy the evil. I hope some of your readers may communicate an efficient remedy, in the mean while, I will try grafting on the common wild Cherry of the country, say some four or five feet above the ground, as the splitting is usually two or three feet from the root. Plums, Nectarines and Apricots would do well, were it not for that pest of an insect which punctures them, and frequently takes the whole crop. It may as well be called Curculio, I suppose, as anything else, but those who have written its history are sadly at fault, for we have been informed by them, that it is propagated from the falling fruit, which contains the larvæ, or worm, which burrows in the earth during the winter, and in the spring appears in the form of the Curculio. This cannot be the case, as last year we had neither Apples, Pears, Peaches, Nectarines, Plums, nor any other fruit in this or the surrounding counties; yet the ravages of this insect were never greater than they have been this season, so that it could not have been produced from the decaying fruit, for we had none. I have a goodly number of the worms or larvæ, confined in a close place, where I intend to keep them until next spring, and endeavor to learn their changes, habits and appearances. Can you give us anything new on the subject?

Apples, Pears and Grapes grow as fine in Habersham county, as in any other place; we have as fine Apples, both of Northern and Southern varieties, as are grown any where; the best of the Southern varieties are better than the best Northern. I have been engaged in their cultivation both at the North and here, so that I speak advisedly; we can lay the far famed Northern Pippin in the shade with some of our native varieties. I have all the best Northern varieties, as decided by the Pomological Congress of 1848, and can beat them with some of our natives, both for size, flavor and keeping. Pears succeed well also, especially when worked on Quince stalks. The Bucrre Pears are delicious, of good size, easily cultivated and occupy but little room; every garden should contain at least a dozen trees. The only disease they are subject to, is the fire-blight, which I find to be easily cured when it makes its appearance—it being caused by a too high system of cultivation; too much sap being formed, and too rapidly, so that it cannot be properly assimilated, and the growth of wood becomes imperfect and diseased; whenever it appears, cut off the diseased limb or twig, dig away the earth and cut off some of the roots. I have caused this disease to attack trees by putting manure about them, and have cured it by the above process.

In your last paper I notice you express a desire that some one would cultivate a nursery for commercial purposes. I have one under way, and will have next fall a stock of trees fit for delivery, of all the best Northern and Southern fruits, at Northern prices. I have been engaged for the last six years in proving the best varieties, and when my trees are fit for transplanting, will send you an advertisement for publication.

Should this article find favor with you, I may

possibly give you another on the native flowers of the mountains at another time.

J. Van Buren.

Clarksville, Ga., Oct. 10, 1850.

Remarks.—We have little doubt that excessive heat is the immediate occasion of the splitting of the bark of the cherry tree, and have therefore regarded protection from the sun during the hottest part of the day as a preventive. Trees standing on the North side of a house or fence, have been exempt from this malady, while others exposed to the full sun have not. If it had not been tried by Mr. Van Buren, we should have recommended boxing on the South and West-Has the trial been faithful?

It is believed that the Curculio, in the absence of fruit, deposits its eggs in the tender bark of the twigs of the tree, and hence the insect may be propagated without a crop of fruit. We have a few bearing trees, the fruit of which has invariably rotted and fallen for the last six or eight years, and mostly after fully grown—have examined frequently, but never been able to find a worm.

We congratulate ourselves, and lovers of good fruit, that there is further proof that we can grow among ourselves, as good and better apples than can be found at the North and shall be glad to have further testimony from the same source as the above.—Eds.

The Reviewer.

Review of the September Number.

Messrs. Editors:—If you are in the vein we will run over the bill of fare in Sept. No. of the Farmer and Planter:

No. 1. Mr. Stewart's on Reclaiming Worn out Lands-—A very sensible document. It is a misnomer to call it resting land—when you pull down your fences, and turn your fields open to all sorts of stock. And it is folly to allow weeds and grasses to grow up, without turning them to some account by turning them under, before they have given back to the atmosphere the materials derived from it.

There is a senseless opposition to deep plowing. "Dont turn up the clay or you'll ruin your land," is often heard even in this day, falling from the lips of those who should know better. Now you may put it down as a fixed fact, that all soils are formed by the debris of the strata of rocks upon which they rest, and the accumulation of vegetable matter (leaves, limbs and roots of trees, grasses and weeds) which have been collecting for past ages. Well, if a farmer by a system of cropping, takes off in his cotton stalks and cotton, corn and corn-stalks, wheat, rye, &c., year after year, a portion of this vegetable matter, common sense will tell him that he will soon arrive at the end of his row—and common sense should likewise tell him, that there is but one way of getting back—that is, to plow thoroughly the subsoil, and intermix with it vegetable matter. If it ever possessed the inorganic substances (i. e. lime, soda, potash and magnesia) it has them still, and the addition of vegetable matter, with good tillage, will restore it.—but if the subsoil is naturally deficient in such salts, we advise the owner to give it away and look out for a new home; for, to make it rich, will make it like the Indian's gun, cost more than it comes to.—

"Horticulture" we dont profess to know much about—but we are some on Snaps. Dig the ground deep—plant shallow—cultivate often, and at every working sprinkle ashes over them. For Asparagus, there can be no better manure than ashes, lime, coal dust and a little salt.

"Potatoes."—In this department we are no "small potatoes." We plant in ridges—subsoil the ground well—use the "draws" from the root only. At the second working sprinkle a handful of ashes to each root—you know the potato abounds in potash. We do not approve of the Committee's plan of "private banks" upon the bare ground—they are apt to be affected by the changes, convulsions, &c.; we like a good dry foundation to begin upon, and are apt to find as sound potatoes at the bottom of the vault as at the top. Nor do we like to close all up at the top—we prefer having a little hole to peep into now and then, to see that all is right and to let off the steam. As to the process of "winding the bank up at once," it will never be found very difficult when the "contents are put in a convenient place."

The Report of the Committee on Peas is a very interesting one, but contains some very important errors. It says that "Gluten, so absolutely necessary to the perfect maturity of the whole cereal crop, does not form a constituent of the seeds of leguminous plants;" and yet it asserts that, according to Playfair, 100 lbs. peas gave gluten 29—unazotized matter 51½. Prof. Johnson says that the "seeds of leguminous plants are especially rich in substances containing nitrogen." According to Rochleder, legumen (of peas) consist of:

Carbon	54.5
Hydrogen	7.4
Nitrogen	14.8
Oxygen	23.3
	100.0

while gluten of wheat consists of:

Carbon	53.05
Hydrogen	7.11
Nitrogen	15.50
Oxide, Sulp. and Phosp.	23.50
	100.00

There can be no doubt of the nutritious and fattening properties of the pea. Nor can there be any doubt of its being a great ameliorator—but *why* it is, is the question most worthy of solution. Its broad leaf may rob the atmosphere, and its penetrating tap root may go deep down into the clay and bring up salts for the use of other plants, not necessary to its own perfection. These are questions yet to be answered satisfactorily.

"Corn Planting", by A Little Farmer.—When a man plants corn as deep as he can, and throws up a high bed with a twister—does he not leave the ends of the roots now looking every where for food, exposed, and less able to stand a drought than if it had been laid by nearly level.

Editorials—"Wool Growing in the South."—Kill all the spare dogs and manufacture our own woollen fabrics, and we will begin to talk about it. The U. S. Assistant Marshal for our district tells me there are ten dogs to one sheep in this district, and still our people say they love mutton.

"Lime and Marl."—A knotty question—about which much has been said and written. There are few farmers who can afford to use it who do not live in a stone's throw of a lime kiln—the transportation is so costly. We believe the principal value lies, not in it as a manure itself, but in its capability of converting vegetable matter into manure. Many of the best soils in the world have not two per cent. of lime in them—nor does the analysis of many plants prove the necessity of a large supply.

"Clover at the South."—Mr. Cooper's report is cheering—there are many indigenous grasses amongst us capable of being turned to profit—but will we do it—we could do a great many things if we would try. We could grow our own grass, our own wool, manufacture our own flour, clothes, tools, tubs, buckets, hats, shoes, and agricultural implements—we could do all this, and more, as easily as live under the colonial vassalege we now do, to a people who are ready to cut our throats when we assert our right to be free.

"Help One Another,"—Every body will agree with "Greenville"—but will everybody "put his shoulder to the wheel"—there's the rub. It reflects very little credit upon the intelligence of the Farming and Planting interest—that the editors of the only Agricultural Journal of the State are forced to fill their columns with extracts from northern papers—

"Farmers teach ye one another"—there are few of you who do not know something worth telling, and fewer who are not able to tell it. The plainest, simplest language is the best, and the success of any mode of culture will not be hazarded by publishing it in the Farmer and Planter. It is a standing disgrace to the State, that one Agricultural Journal at the low price of $1 per annum, cannot be sustained. Almost any one district, if the Agricultural population had the spirit to speak out, the intelligence to understand what is useful to them, and the nerve to strike for their own interests, could support such a journal without inconvenience. You will hear men say—they have no faith in book-farming, the paper can teach them nothing. There is no fool so intolerable as he who is unconscious of his own ignorance. You will hear others declare that they are not able to take the paper—go to their houses, and ten to one you will find a fitified yankee clock upon the shelf, and a Northorn newspaper full of dishwater poetry, lacadaisical stories, revolting scenes and shameless profligacies. Out upon such miserable, shallow subterfuges!

"Mica."—We extend the hand of welcome to our friend Mica, and assure him we will be most happy to see his shining particles mingling "with the waters of 'Big Branch.'" This is the first word of encouragement we have had from any quarter—we were beginning to despair of sympathy. We advise Mica to lay on hard—he has a most thick skinned set to deal with, and none but the sturdiest blows will affect them. It is high time a people who profess to be agricultural, were shaking off that ignorance which has so long hung like an incubus upon them. Politicians have betrayed the country, and upon the Agricultural interests now rests the responsibility whether the South shall be free or not. It has come to that point.

"Mr. Ruffin's Essays."—Mr. Ruffin always writes sensibly and pointedly.—He is a gentleman of enlarged views upon every subject of agriculture—of great practical knowledge and very respectable scientific attainments. He is a most earnest writer, believes what he writes, and has proved by actual experiment that a man may farm scientifically, write well, grow rich, make his lands daily better, and act and live like a gentleman. We are through and reckon you are glad.

Yours truly, Broomsedge.

Big Branch, Sept. 16, 1850.

The above should have been published in our last number, but came to hand too late.—Eds.

Review of the October Number.

As the nights are growing longer—for the want of something better to do, let us discuss the merits of the Oct, No. of your journal.

Professor Norton writes sensibly, we like to read such things, albeit they are of little profit to us, these fancy manures may do very well for gardens and fancy farms at the North, but a fellow would starve hereabouts, picking up bones, ivory dust, horn, wool and hair to manure a cotton plantation.

"Rat-proof Corn Cribs."--The Dutchman's rats must belong to a breed easily frightened from their propriety, if they can be kept out of cribs made after his fashion, we can supply him with a variety, that will convince him that Sam Patch was right when he said "some things could be done as well as others"

"Over Cropping, and Order, System and Economy."—Capital articles, but about these matters you may as well "sing psalms to a dead horse" as to the planters of the south. They will all, like young people going to you for advice, thank you very much, declare it excellent and go right off and do just as they please.

"Compost Manures."—Very good—these are the kind the back country farmer must rely upon for the present. A vast deal can be done in this way if one will only try. But you must go at it systematically—make it a part of your farm work positively—or it will amount to nothing. There is no better absorbant of the salts of manure than clay—be sure then to mix it with your manure heap and have ditches and embankments across your manure lots to filter all the water that runs through them and conduct the overflow upon your grass lots. It will tell, you may rest assured of it, every where it touches.

"Nutritive Properties of Grains."—Science is certainly doing something for us in this department. What will Mr. Practical man now say, when you tell him that the principal part of the fat forming, and a large portion of the musele and bone making material, lies near or in the skin of wheat and other grains—eh? He won't believe it because it's "book larning." It was only a day or two since that one of these practical wise-acres told us that "there was no strength in wheat chaff and bran, worth mentioning, he know'd it, because he'd tried it."

"Sheep Husbandry in Alabama."—A capital letter from Hon. H. W. Collier to the Editor of the Plow, Loom, and Anvil. Mr. Skinner must either lay aside his plow or high Tariff principals. It is the veriest folly in the world to try to reconcile them. Upon a remark of Mr. Collier's "that the industry of the South does not require protection for cotton and woollen manufactures," Mr. Skinner talks quite feelingly and quotes copiously from whig papers to prove "that owing to the working of the *beautiful* tariff of 1846," many Northern manufactories are closing their works and that from only three points 1500 men heretofore earning from $1 to $2 per day, will be thrown out of work, and the $2000 a-day will go practically into the pockets of the iron-workers of Great Britain." Aha! and they cant compete with the degraded labor of Great Britain." Whose fault is it? If a back country capitalist that put up a Rice Mill and fail for want of work, whose fault would it be? If the South could not compete with India in the production of cotton—think ye these lords of the Loom and Anvil would cry for protection to our labor? But admit that the tariff is increased and these worthy sufferers get their $2000 a-day—where does it come from, this that makes the pot boil—from the lords of the Loom or Anvil? Oh no—it comes out of the pockets of the planter who *uses* the iron, and the negro blankets, clothing, shoes, &c. And where goes the increased profits of manufacturing? into the pockets of the poor laborer?—oh no! into the capitalist's pocket—and if he can't make his 15 and 20 per cent—humane man! the "poor laborer" must be turned adrift, and a howl of desolation all over the land, about a "ruinous competition with the degraded labor of Great Britain." "Protection to our infant manufactures" has been the cry since 1815, poor rickety things! Will they never stand alone? They have been fed upon pap too long. It is high time to take off their swaddling clothes, and let them try to stand alone.

Editorials—"Wheat Culture."—A sensible article. Prepare the soil well is all important—be sure you sow seed enough—remember that a bushel of soaked is not a bushel of dry wheat, and that as late sown wheat has not the time to tiller well, you must put more in the ground. Early sowing and grazing may suit sandy soils and dry seasons—but on clay land and during wet seasons it is never safe. It is all a notion to think it will prevent the depredations of the fly—the worst injury we ever received from the fly was when the wheat was grazed by sheep and calves till 1st March. We like to have the ground broken up well and one or two good freezes before sowing—you are then only in danger of the brood of Hessians which may come out in the spring—*perchance* too late to destroy.—There is no doubt of the fact that a solution of blue stone will prevent smut.

Mr. Ruffin may think what he pleases about wheat turning to cheat. *We* believe it will, and *think* we have good reason for our belief.

"Fruit."—Glad to see a taste for good fruits growing upon the people. There are few countries better adapted to fruit growing than South Carolina. The will and the effort is all that is necessary.

"New Cotton."—Some people are always "cutting off their nose to spite their face." It may be put down as a fixed fact, that there is no danger of the supply exceeding the demand for this great staple. The experience of years proves incontestibly that the consumption keeps ahead of the production—while common sense should teach any man that there are a thousand uses to which it may still be profitably applied.

"Improvement of Worn out Lands.',

Mr. Bargwynn is eertainly right in his Theory and Practice. Every body will agree with him and very few follow his example. Nor will it be otherwise, till intelligenee is more widely diffused amongst the agricultural elass, and our pursuits more diversified. As long as we practiee the *one idea* system, eotton and fresh land, it is all humbug to talk about reform.

"Horses *versus* Mules"—*alias* Planter *versus* Latham.—The jury finds a true verdict in both eases. Both gentlemen are right and both are wrong. Truth lies between them. The mule is hardier, easier to keep, longer lived, and better adapted to the negro. But nobody would want to ride or drive a mule. The horse is hy all means the animal for the sadle and the earriage. There are fast and slow mules as well as fast and slow horses. Treatment goes a great ways.

"Rice Culture."--Every farmer should endeavor to grow enough for his own table. A very easy matter many say—but we have not found it so. Could not H. give us some thoughts on the subject?

"Moles."—We stick to it, that the chances are two to one, that moles do more good than harm. They help us tend the crop and have a right to a part of its proceeds.

"Fowls."—There are some old women in the eountry we wot of, whose ehickens always lay their eggs, hatch well and grow fat—we believe there is mueh more in the food than the breed, and then there is a good deal in the cooking. Mr. Lewis could perhaps get an Ayrshire Bull of Mr. David Gaillard near Winnsborough S. C. That is *the* stock for this country.

"Flowers" and Broomsedge never grow well together, however proudly they may hold their head for a season, and we are sorry to say so.

Broomsedge.

Big Branch, Oct. 12, 1850.

From the American Farmer.

Essays on various Subjects of Practical Farming.

BY EDMUND RUFFIN, of Va.

On Draining.

[*Continued from page* 111.]

These three ela sses of low land agree in heing formed either wholly or in part by the alluvial action of water, and in requiring relief mainly from the injuries of surface-water applied in streams. But in the time and manner of the alluvial action, and the results, and also in most other sespects, these several kinds of wet or low lands are very different from eaeh other. Also in the methods of draining there are important matters of differenee, as well as agreement in other respects.—The greater number of bodies of low ground (exeluding tide-marshes and extensive peat swamps or bogs,) belong severally to one or another of these three divisions; but many others partake of the eharacters of more than one. But great as are the differenees of eharaeter of the several classes, as here arranged, and even of different bodies of land, belonging strictly to some one elass, nearly all such lands are or have been fertile, and possess great agricultural value—unless so far as the value has peen impaired by ill-directed labor of tillage or of drainage. Passing by all minor variations, whether natural or artificial, the different classes of low lands will be described and treated according to their respective general characters, and their requirements for drainage. According to their qualities of surface and of soil, all these lands will need the drainage of surplus rain-water, by water-furrows, grips, and rain-ditches, in like manner as directed above for higher lands. But in addition, these lower lands require the proper use of stream-ditches, as the especial and most important means for their drainage: and which means will be the principal subject of the following observations and instructions.

1,—*Bottom lands of elevated valleys, bordered by high hill-sides.*

In a hilly region, or where high tableland is cut through by valleys, every such valley is, throughout its length, passed over by a stream, which, in past times has brought down and deposited all the earth now composing the soil, and the inferior beds for a considerable depth.—The stream has enough of descent, and consequent velocity, to be at all times rolling onward slowly the sand in its ehannel. When swollen by rains, the supply of transported earth, washed from the hills, is greatly increased; and the stream then overflowing the low land generally, deposits the heaviest partieles of earth (sand,) nearest its margin, and also in greatest quantity, while the finer clay and washings from rieh soil, are longer suspended in the flood, and when dropped, are spread thinly over lower levels and at greater distanees from the stream. This natural and continued action of all rapid and overflowing streams operates to raise the land highest nearest the stream; until so much dtfference of level exists, that at some time of overflow, or because of some new obstruction in the old ehannel, the stream leaves some portion of its former bed, and finds or opens a new passage through a lower level. Thus every lower part is successively raised by either temporary overflows or the more permanent ehanges of the eourse of the stream. And by these operations, whatever may be the slope of the bottom of the valley along its length, the surface is not far from level, at any time, in any cross line. The difference of height of surfaee in any sueh eross line will rarely exeeed two feet.

The main streams of sueh valleys are of all sizes from mere rivulets to large mill-streams, or even small rivers. The bordering flats are of widths bearing some proportion to the sizes of the streams; and are usually within the extremes of 30 to 150 yards wide. The streams have eonsiderable fall, or rate of deseent in their course—say from 8 to 15 feet in the mile. The bottom land has still more fall than the stream. The natural laws which regulate the motion and the effects of flowing streams tend eontinually to equalize the whole fall, or descending grade, of the bed of each stream, and of the bordering alluvial land; and also to something like equality the respective grades of different streams and bottoms. For if there be an excessive accumulation of deposited earth, and of height of level of the low ground, at the upper part, (the place of first and largest supply from the hills,) the stream will he made more rapid by the greater fall so given to its bed, and subsequently, it will earry all moving or suspended earth to a lower level, before depositing any. Not only so of the supplies of earth from the hills, or or the higher streams, put its own channel will be cut deeper and wider, and the excavated earth removed to much lower levels, where the fall is less, and the current has less velocity. And if any intermediate part of the channel should have much less fall than the adjacent parts above and below, this more level part of the stream will receive accessions of earth to raise its up-stream part, until the general rate of fall has been nearly equalized. And low parts of the land, from the natural and obvious operation of the water, will receive larger shares of the deposited earth, until brought to the general height, and nearly to the average grade. Therefore—provided there is sufficient length of stream, and of general fall in its course, and also that the soil of the bottom is of loose materials, subject to be abraded and removed by water—every stream will tend to approach a certain degree of uniformity of fall in all parts of its own course; and also of uniformity of its fall with that of all other similar streams—and consequently, of the alluvial hordering lands, whose deposition and height of surface are produced by the action, and are proportioned to the height of their streams. This general grade, to which all streams (of the character stated) tend to bring their channels, is within the two extremes of being so steep as to be liable to be cut deeper by the current, and so level as not to permit the further rolling onward of the sand brought from above, and so are constantly choked by the stoppage. Within these extremes will pe found most streams in their natural channels. But this equalizing operation of flowing water must cease when it loses the general fall, or the low-enough discharge, necessary for the exertion of the power. If the stream is discharged into a mill-pond, or upon a tide-marsh, of course all its fall there ceases; there is nothing to receive or carry off the deposited earth, or at least its heavier parts; and of course the channel of the stream would be filled up with the earth washed from its upper parts, unless often cleaned out.

These natural and universal laws of moving water, and the certain effects, should be brought to aid, and fully to concur with the designed operation of every plan of drainage in such situations. If in sueh eases, we bring Nature to work with and for us, the beneficial result desired will be surely and easily obtained. But if in opposition to Nature and her laws, the labors for drainage will yield more disappointment and failure than success and profit.—(*To be continued.*)

The Farmer and Planter.

PENDLETON, S. C.

Vol. I., No. 9:::::November, 1850.

DELINQUENTS.—We regret that we are obliged to request those of our subscribers, who have neglected payment for the first volume of the FARMER & PLANTER to forward to us the arrearage. Our terms it will be recollected are payment *invariably in advance.* No other system can possibly be practicable.

Acknowledgments.

WE have received from B. P. Johnson, Esq., in behalf of the New York State Agricultural Society, the ninth annual volume of its transactions, containing a course of lectures by Prof. J. F. W. Johnston, and the prize essay by Prof. Norton, entitled "Elements of Scientific agriculture." The volume is invaluable.—Accept our thanks.

☞ THROUGH the politeness of the editor of the American Agriculturist, a copy of the lectures by Prof. Johnson "On the general relations which science bears to agriculture," is on our table.—The more of them the better.

☞ We are indebted to Robt. Sinclair Jr. & Co., of Baltimore, for a catalogue of Agricultural Implements, Garden Seeds, &c. The establishment of this firm is extensive. See advertisement on last page.

☞ To the enquiry of Mr. T., we would say the "Working Farmer" is published in New York city, at $1 per annum, edited by Prof. Mapes, and is an excellent journal.

Claims of the agricultural Interests to Legislative Aid.

NEVER did times more clearly than the present vindicate the claims of the Agricultural interests to the fostering care of legislation. We mean no federal scheme by which one part of the country is fattened at the expense of the other. We look only to that aid which it is the right of the people of every State to ask, and the duty of the legislature to give.

It is now the policy of almost every enlightened government upon the globe, to encourage a love of rural pursuits in its population, and this is more and more the case just in proportion as each nation rises higher in the scale of civilization. It is becoming the opinion of all men, every where, that the cultivators of the earth ought not to be less intelligent or less informed in whatever pertains to their vocation, than other classes. Hitherto, that they have been, is too true. All over the German States. and other parts of Europe, Academies and Colleges of Agriculture are established in large numbers, and supported out of the public treasury; and though we should not draw our models from such a quarter, there is much among them, whereby, if adopted, we may profit—much from which we have already profited.

It is not to be doubted, that if these institutions have not accomplished all that is desirable, they have elevated vastly the standard of agricultural knowledge, contributed greatly to the comfort of the population, and laid the world under a heavy debt of gratitude for the light they have thrown, through their agricultural chemists, upon the science of farming. It is said whcrever nature does most for man, he does least for himself—and we fear this is true of us at the South. There are within the limits of South Carolina more than 16,000,000 square acres of land, and only 1,300,000 under cultivation; more than 14,000,000 yet untouched by the plough. and 800,000 worn out, and laid desolate in exhausted old fields This shows it is time for reform.—We have too long cavilled about trifles, and utterly overlooked the main chance. Our legislators are under obligations from which they cannot escape, to take more comprehensive views and embrace a more enlightened, liberal and statesmanlike policy. In this there is no time to lose. Other States whose soil is barren naturally, and climate bleak, are making rapid improvements in the art of tillage. Their population is stimulated to exertion by the helping hand of legislation; every source of wealth and comfort is laid open, the treasures of the earth are being unlocked to man's use. As some evidence of public feeling upon rural pursuits, there are in some of the larger States 100,000 readers of papers devoted solely to farming—the anniversaries of their agricultural exhibitions are occasions for the assembling of a hundred thousand people, men from every State in the confederacy, from Great Britain and the continent of Europe.

The occasion is full of instruction, and such as to excite an interest of the highest magnitude to the agriculturist. It is a jubilee to the farmers of half the world. But how is it in the South? What is the anniversary meeting of the South Carolina Agricultural Society? alas! too insignificant to form a nucleus of its own, and absolutely driven to take advantage of the body of planters assembled during the session of the legislature to secure a few hundred listeners to the address. This displays a most melancholy state of things. And what is the remedy? Nothing, which does not arouse a spirit of improvement among us. This is the first great desideratum. We must be induced to count the profit and loss of the course we are pursuing, and made to see, while the christian world is progressive in the art of husbandry, we by an ignominious course of culture are laying waste the fairest portions of earth, and making ourselves poor and homeless. Miserable, indeed, must have been the management that has worn to a point of abandonment nearly 1,000,000 of acres, and pitiable indeed must be the condition of a people who inhabit a country of which there are only 1,300,000 of tillable land and 14,800,000 waste. But thankful are we that this is not in fact the case, though from the number of acres uncultivated and the extent of emigration, it might seem to be so—or to indicate inferiority in productive capacity. It is nothing new to say the resources of no State are greater or more varied than of this and Georgia. In rice lands unequalled, in cotton unsurpassed, in the grains and roots productive, in fruits excellent, in mineral wealth inexhaustible. To develope these capabilities and make them appreciable, we need direction from the hand of agricultural science; we want that assistance which the legislature alone can furnish. We desire to know something of the connexion of the rocks and the soil we cultivate, of the laws of rain, wind, frost, light, heat, and darkness, which control the fruits of our toil. We wish to be introduced into the departments of Chemistry, Geology and vegetable Phisiology, and the government is as much bound to teach us in these as in Greek and Roman literature.

The progress of other States drives us to investigate principles of natural history, and direct our industry to the best advantage in order to compete with them. Mississippi and Alabama have their State Agriculturists—Maryland, a little State, groaning under a debt of $15,000,000, has her Agricultural Chemist, and instead of feeling the additional expense, is by this means confessedly better enabled to meet the interest on her debt. Do not tell us now is not the time to increase our expenses for such purposes—when will it be? when planters shall have, Atlas like, carried the burden of government another seventy years on their shoulders? A salary of $2000 appropriated judiciously would be of more value annually, than the whole capital of the Bank of the State. We do not ask what the planting interest has a right to demand. We only ask small things.

Let provision be made by the legislature about to convene, to employ an Agricultural Chemist of unquestionable practical skill and scientific attainments, who shall go upon our plantations, analyze our soil, tell us its constitution, its deficiencies and excesses, to what crops adapted and what not, the proper rotation of crops, the connexion of the disintegration of rocks with soils, the true economy of making and applying manures, the best means of reclaiming exhausted lands, &c. Let him deliver a series of popular lectures at our court houses, villages and before our agricultural clubs, and teach us by plain practical conversation, that we are totally and shamefully ignorant of our business—a lesson we have yet to learn. We do not mean that he should attempt to make thorough geological surveys, we have not quite come to that, and are afraid to ask it. By this course an immense amount of information will be imparted in a single year, and still more, a degree of interest excited among farmers that will be the beginning of a glorious reformation among us. It will be the initiative step to a higher and more thorough plan of agricultural education. Out of it will grow a thorough system of surveys in every district in the State. Public sentiment will force

our legislators to place in our college a Professor of agriculture with adjuncts if necessary, who will infuse into our youths the true spirit of rural economy.

Fair of the Muscogee and Russell Co. Agricultural Association.

This will be held, as we learn by the Enquirer, at Columbus, Ga., on the third Wednesday in this month. Preparations are making for an extensive exhibition. The board of managers invite farmers, manufacturers and mechanics generally, within reach, to present the products of their industry for inspection. The society, if we mistake not, was organized the last summer, and this, of course, will be its first show. It is a good beginning, and will probably on this occasion put to blush many of the old societies. We intended to give a full list of the premiums offered, but it is unavoidably crowded out. The amount is very handsome. The following are some of the most important prizes.:

For the best Treatise on Making and applying Manure, suited to Southern crops and culture, silver goblet, $10 00
For the best Treatise on cultivating corn at the South. silver goblet,..... $10 00
For the best Treatise on the cultivation of Cotton, including the picking and packing, silver goblet..... $10 00
For the best Treatise on the Farm, by a youth of Muscogee or Russel, the Birmingham medal $5 00
For the best bag Cotton, grown in Muscogee or Russel, silver goblet,..... $8 00
For the best Georgia and Alabama raised Jack, exhibited on the day, Silver cup,..... $8 00
For the best Stallion, four years old and upwards, silver goblet,..... $10 00
For the best 2 year old colt or filly, silver cup,..... $8 00
For the best Plow for southern culture, and of southern make, silver cup,.. $8 00
For the best Treatise on raising Fruit of all kinds in this section of country, silver goblet,..... $10 00
For the best Treatise on the management of the Cow in the South, silver cup,..... $8 00

Experiments in Butter Making.

The following valuable experiments are taken from an Essay on Butter Making, by Professor Traill, of Scotland, published (we believe) by the Highland and Agricultural Society. We copy from the Plough, the Loom, and the Anvil, for May.—*Southern Planter.*

Experiments, *to show the comparative quality of butter yielded by*

No. 1. Sweet cream churned alone.

No. 2. Sweet milk and its cream churned together.

No. 3. Sour cream churned alone.

No. 4. Sour milk and its cream churned together.

No. 5. Sealded cream, or Devonshire cream, churned together.

On the 24th May, the milk of four cows was drawn into the same vessel, passed through a strainer, and then divided into five portions of six English pints each, which were placed in similar basins of earthenware in a milk house, the temperature of which ranged from 55 to 60 deg. Fahrenheit.

Monday 25th.—The temperature of the air was very hot, 76 deg. but that of the milk house, by constant evaporation of water, was kept about 60 degrees.

Tuesday 26th.—Thirty-nine hours after the milk had been drawn from the cows, it was removed from below the cream of No. 1 and No. 3, by a siphon; and we immediately began to churn the cream of No. 1, and the milk and cream of No. 2, in glass vessels.

No. 1. *Sweet cream churned alone.*—Having previously found that the addition of a small quantity of cold water to thick cream facilitated the separation of the butter, half a pint of water was added to the cream and it was found that the temperature of the mixture at the commencement of the churning was 62 deg. In fifteen minutes, butter appeard in grains; the churning was continued for twelve minutes longer, i. e. twenty-seven minutes in all, when the temperature of the whole had risen to 76 deg. The butter was now collected into one mass, bnt from the warmth of the weather, was very soft. It was, therefore, put in cold water, and placed in the milk house until the morrow, when it was worked and washed in the usual way, and weighed 1386 grains. It was a good color, and perfectly well flavored.

No. 2. *Sweet Milk and its cream churned together.*—The mixture of sweet milk and cream was churned at the same time; but, though cold water was here added, after one and a half hour's churning, no butter was to be seen. The churning was continued for as long (in all for three hours,) but without obtaining a particle of butter.

No. 3. *Sour Cream churned alone.*—On *Thursday, 28th May*, the cream of No. 3, which had been separated on Tuesday, and placed in the milk house, was now slightly acid, and was churned after half a pint of cold water had been added to it. In twelve minutes butter appeared; and in eight minutes more, it had united into one mass. During the churning, the temperature of the cream had risen from 54 to 63 deg. The butter-milk was very poor, fit only for pigs. The butter when well washed, and worked to separate the watery part, weighed 1756.5 grains.—The color and taste were very good.*

No. 4. *Sour Milk and its Cream churned together*—On the same day, *28th May*, the milk and cream which had become acid were churned together, and half a pint of cold water was added. It was fully fifty-seven minutes before any butter appeared; and before the churning seemed to be completed, one hour and fifty minutes had elapsed. This shows that much more time is required to churn milk and cream together, than to obtain the butter from cream alone. The butter was, in this instance, diffused in small grains, and when washed and worked as long as any color was communicated to the water, it weighed 1968 grains. Its color was rather paler than the last, but its color was good. †

No. 5. *Clouted cream churned alone.*—On *Tuesday, the 26th*, the milk and cream of No. 5 were placed in a vessel of warm water, until the temperature of the milk rose to 156 deg. In these experiments on scalded cream, we had the assistance of a Devonshire dairy-maid to superintend this part of the process. She generally placed the vessel containing the milk among the embers of a low fire: but we preferred water as the heating medium. She judged of the due degree of heat by merely dipping her finger in the milk, and the wrinkling of its surface; and we found that the heat considerd by her sufficient, generally ranged from 135 to 156 deg. and was occasionally as high as 160 or 162 Fahrenheit. The milk was drawn from below the cream by a siphon; and the latter was placed in the milk house, until the following day, before it was churned. It was churned on wednesday, 27th.—The milk of this portion was very poor, had a scalded taste, and would have been unsaleable.

I may here state, that by churning the milk of No. 1 and of No. 3, we could obtain a few more grains of butter, on some occasions; but we never could obtain the smallest quantity of butter from the milk of No. 5—so completely does the scalding process separate the butyraceous matter from the milk. The butter of No. 5 when well worked and washed. weighed 1998 grains. It has a rich yellow color, tasted agreeably, and was quite free from the peculiar scalded flavor of the milk.

Series 3.—This series, a repetition of the preceeding experiments on the milk of four other cows, was commenced on *Tuesday, the 25 day of June*, or a month after the last series. As before, the whole milk was mixed' strained, and divided into five equal portions, of six pints each, which were treated as the last.

No. 1. *Sweet Cream churned alone.*—On *the 26th*, or in twenty-four hours after the milking, the milk of No. 1 was drawn off by the siphon. The temperature of this portion, at the commencement, was 62 deg. and when the churning was finished, had only attained to 65 deg. The churning required forty-five minutes.—Water had been added as before, and the butter was obtained in grains like peas. When well worked and washed, it weighed 1137 grains. Its color was good and the flavor excellent.

No. 2. *Sweet Milk and its Cream churned together.*—The sweet milk and its cream churned together afforded no butter.

* The butter-milk from cream alone was poor and thin, in this and in all our experiments, whether water had been added to the churn or not.

† The butter-milk from No. 4—that is, from churning milk and cream together, when slightly acid, is a bland, agreeable fluid, containing much albumen or casein. It finds a ready market in towns, and is much used in Lancashire as an article of diet. It is therefore a valuable product, which ought to be considered in an economical point of view.

No. 3. *Sour Cream churned alone.*—On *the 29th of June*, the cream, which had become sour, was separated by the siphon and churned. The temperature at the commencement was 58 deg.—and at the end, it was 65 deg. The butter was fully formed in forty minutes, and united into one mass. Well worked and washed, it weighed 1246 grains. Its taste was good, as was its color.

No. 4. *Sour Milk and its Cream churned together.*—At the same time, the sour milk and cream were churned, with the same precautions as before. The churning occupied two hours; when the temperature had risen from 58 deg. to 68, or nearly 69 deg. When worked and washed, the butter weighed 1447 grains. The qualities equalled that of No. 3.

No. 5. *Clouted Cream churned alone,*—The cream of this portion was scalded on Friday, *the 26th of June*, by being heated to 168 deg. which temperature is attained in one hour, the usual time required for this operation. On Saturday the 27th, it was churned in forty-five minutes; during which time the temperature of the cream rose from 58 deg. to 64.deg. When well washed and worked, it weighed 1591 grains. The butter, in the mouth, had a granular feel, which we attributed to the heat rising, by accident, two high: by which an unusual portion of casein appeared to be separated with the cream. The butter had, however, no peculiar flavor from the process, although the milk would have been unsaleable, from a strong taste of *scalding*.

The general result of these experiments, confirmed by many similar trials, is, that the largest quantity of butter is produced from the scalded, or Devonshire cream; the next in quantity is afforded by cream kept until it is slightly sour; the smallest quantity is obtained from the sweet cream. We were unable to obtain butter from churning sweet milk and cream together; and in several other series attempted it no more.

In one series of experiments we used as much as 11½ English pints of milk in each experiment; but we then had to churn in vessels of tinned iron, and we did not find the results so uniform as when operating on smaller quantities in glass vessels.

Series 4.—This series was intended to decide on the qualities of the butter obtained by the four processes above detailed, as to keeping fresh. These experi- were made, as those on the next series, on the butter obtained on most of our experiments. No. 1 always remained when exposed freely to the air, longer without any rancid taste than any of the other kinds of butter. No. 3 and No. 4 were nearly on an equality in this respect; if there was any difference it was in favor of No. 3. No. 5 became rancid more quickly than No. 3 or No. 4·

Series 5.—Equal quantities of butter obtained by the four processes were salted with equal quantities of salt, then spread thinly on glass plates, and exposed to the air in a dry room. They were inspected from time to time, and it was ascertained that the taint of rancidity always appeared in the following order, commencing with that which showed it first:

In No. 5, or butter from scalded cream.
No. 4, " " a mixture of sour milk and its cream.
No. 3, " " sour cream.
No. 1, " " sweet cream.

The cause of this difference in their power of resisting decay, was believed to depend on the varying proportions of casein, or curdy matter in each. To determine this point, another series of experiments was undertaken.

Series 6.—Two hundred grains of each kind of butter were kept liquified, by a moderate heat. in glass capsules; the oily matter was taken up by bibulous paper, successively applied, as long as any oily stain was perceptible; the watery liquid which remained below the oily matter was evaporated, and the solid residue, after being well washed, squeezed between the folds of blotting paper and dried, was carefully weighed. Unfortunately I have been unable to recover the details of this series of experiments; but the following are the general results, which decidely show that the presence of the greater quantity of casein in butter coincides with its greater tendency to become rancid. The four kinds of butter afforded casein in the following order, commencing with that which yielded the most:

No. 5, butter from scalded cream.
No. 4, " " acid milk and its cream.
No. 3, " " acid cream.
No. 1, " " sweet cream.

Experiments had been made in October, 1846, which proved that overchurning—that is continuing the process after the full separation of the butter—was very injurious to the quality of the butter, although it increased its weight; and though made before the experiments detailed above, shall now be indicated as

Series 7.—The cream of six English pints of milk was separated by a siphon, and churned in a glass vessel. The butter was formed in about half an hour, but the churning was continued half an hour longer, when the butter had lost its fine yellowish waxy appearance, and had become pale and soft, while very little liquid remained in the churn. This butter was so soft that it could not be washed and worked, until it remained some hours in cold water, it was pale, still rather soft, and weighed,=2566 grains. That this was beyond the due quantity of good butter, from such a quantity of cream, was apparent when the comparative experiments on the same quantities of the same milk, but only churned till the butter was well formed, gave the following results:—

No. 1, sweet cream overchurned, yielded equal to 2566 grains.

No. 3, acid cream duly churned, yielded equal to 2187.5 grains.

No. 4, acid milk and its cream duly churned, yielded equal to 2397.5 grains.

No. 5, scalded cream duly churned yielded equal to 2671 grains.

The butter of No. 1 tasted insipid, never became firm, and soon turned rancid. It was found to yield an unusual quantity of both casein and watery fluid, which could only be separated by melting the butter.

Similar experiments were repeatedly made, the results of which showed that overchurning is very injurious to the quality of the butter; but it adds considerably to the weight of the article; and it appears to be frequently practised in Lancashire, especially in manufacturing *fresh* butter for *immediate sale.*

It is a common opinion in Lancashire that considerable more butter is obtained by adding *hot water* to the churn than by using cold water. We had invariably found that the addition of a small quantity of cold water, especially in summer, greatly facilitated the separation of the butter, and rendered it more easily washed. But a dairyman informed us that the same quantity of cream, which will yield 14 pounds of butter with *cold water*, will afford 15 pounds, or even 15½ lbs. with an equal addition of hot water. This formed the subject of

Series 8.—On *the 15th of November*, we took from the mixed milk of four cows, two portions of six English pints each, and set them aside in a milk house, the temperatnre of which ranged from 69 deg. to 52 deg. On *the 17th of November*, the cream was removed from each by the siphon, and churned at the same time, in circumstances as nearly equal as possible, except in the addition of water. The temperature of the cream at the commencement of the churning, was 55 deg.

No. 1. To this portion an ounce and a half of water at temperature 45 deg. was added. After churning eighteen minutes, the butter began to appear; two ounces more of water at 45 deg. were added, and the churning was carried on for four or five minutes more. The butter was then worked and washed.

No. 2. To this portion of cream one ounce and a half of water, at 105 deg. was added; butter began to appear after churning thirteen minutes, when two ounces more of at 103 deg. were added, and the churning was continued for five minutes more, or eighteen minutes in all. The temperature of the contents of the churn was 71 degrecs. This butter was very soft, and therefore cold water was added, in which it was worked and washed.

Unfortunately, the note of the weight of the butter in this series has been lost; but I find it stated that the butter of No. 2 was rather more bulky, and weighed a little more than that of No. 1; that it was neither so firm nor so rich a color as the butter of No. 1; and that on pressing it the next day, some watery fluid escaped from it. From this time we inferred that the quality of the butter was deteriorated by the addition of hot water; and that the quantity obtained, by this practice of marketable butter, is not so great as is commonly alleged in Lancashire, although the time of churning is thus somewhat abridged.

The principal results of the experiments above detailed, are—

1. That the addition of some cold water during the churning facilitates the process or the separation of the butter; especially when the cream is thick and the weather hot.

2. The cream alone is more easily churned than a mixture of cream and milk.

3. That butter produced from sweet cream has the finest flavor, when fresh, and appears to keep without acquiring rancidity; but that the buttermilk so obtained, is poor and small in quantity.

4. That scalding of the cream, according to the Devonshire method, yields the largest quantity of butter, which, if intended for immediate use, is agreeable to the palate and readily saleable; but if intended to be salted, it is most liable to acquire, by keeping, a rancid flavor. The process of scalding is troublesome; and the milk, after the removal of the cream, is poor, and often would be unsaleable from the taste it has acquired in heating.

5. That churning the milk and cream together, after they become slightly acid, seems to be the most economical process on the whole; because it yields a large quantity of excellent butter and the butter-milk is of a good quality—a point of some importance when butter-milk is largely used as an article of diet, as it is in Lancashire.

6. That the keeping of butter in a sound state appears to depend on its being obtained as free from uncombined albumen, or casein, and water, as it can be, by means of washing and working the butter when taken from the churn.

Quantity of Ammonia in Bones.—There is about 33 per cent. of animal matter in fresh, dry bones, consisting principally of gelatine with some fatty matter. Gelatine yields nearly 17 per cent. of nitrogen. We shall thus find, after all deductions, from three to four or five pounds of ammonia, slowly evolved by decomposition, for every bushel of bones we put upon the soil. This accounts, in part, for the valuable effects from the application of bones.

When bones are first burned, only a minute portion of ammonia will be added to the soil from their application, the nitrogen and hydrogen forming it, being exceedingly volatile, and both being driven off in their calcination.—*Am. Agriculturist.*

The Subsoil

Many persons have experienced disease and destruction in their crops, when oft recurring on long cultivated fields.—The application of various specific manures and different modes of cultivation, are not always effectual remedies. May not the cause be generally attributed to the want of fresh earth, and a wider range for the roots of the plants? Though these are difficulties seldom occurring in this comparatively young country, they are often to be contended with in Europe, and may ere long become of serious consideration among us.

A certain remedy for these evils is *deep tillage*, by which, small portions of the subsoil are brought near the surface, and add new and necessary aliment to the crop. There is no danger from this operation, if it be not brought up in too large quantities. If there be any inert or noxious matter in it, as a stiff, or poor, intractible clay, an excess of iron, and especially in that form in which it frequently occurs in an acid soil, the *protoxide* of iron, or if there be undecomposed peat, and the like, add lime, ashes, and warming animal manures, and mix the matters thoroughly with the surface, by harrowing, and you will thereby not only secure a healthy soil, but a prolific one.

An unmatched system of cultivation to remedy these and numerous other difficulties, is the use of the subsoil plow, which gradually, year by year, amalgamates the upper and subsoils; and while it is giving health and vigor to the surface, it is ameliorating and improving the lower soil and speedily fitting this also for the great purpose of ministering to vegetable nutrition.

In illustration of this principle, it may be stated, that the inhabitants of Madeira sometimes trench their land to a depth of five or six feet, to get at the fresh earth, for the health of their grape vines, for which they would otherwise be obliged to send to Europe, at great expense to renew.—*Ibid.*

Thuner Storms.—When overtaken, out of doors, by a thunder storm, never resort to a tree for a shelter; better take a wet skin and a safe retreat to the open field. Do not have any metal, nor metalic implements about you while exposed to electricity. Col. Wade Hampton informs us, he once lost a valuable field hand, who was struck down while retreating from a thunder shower, with a hoe carried perpendicular on the head—a negro accomplishment quite prized by the victim. Col. H. said he resuscitated two or three others when stricken down, by throwing cold water over them.

A bright pitchfork, spade, or manure fork carried tine upwards is certain to attract electricity during a thunder storm.

[*Am. Agriculturist.*

Glass Milk Pans.—The superiority of glass milk pans over all others, so far as the preservation of milk and the facility of keeping them clean are concerned, is unquestionable; but whether they will prove the most economical in the end, will depend entirely upon the care with which they are used, and the accidents that may befall them. Metalic pans are liable to oxidate or rust, and consequently are more difficult to keep clean; wooden ones absorb the milk which soon turns sour; and require frequent scalding to keep them sweet; and earthen ones are more objectionable than any other from their weight, liability to break, and the destructive or deleterious qualities of their glazing.—*Ibid.*

Virtues of Smart Weed.

It is almost a sure remedy in a case of cholic. Steep and drink the same as in any other herb tea. In the next place it is worth $5 per hundred for a stock of cattle, if it is cut and well cured when in full bloom. Give an ox, cow, or horse, one pound per week, during the time they are up to hay, and it will keep their bowells and hide loose. It is an excellent physic. If a horse has one pound a week there is no danger of his having botts or worms of any kind; and they will eat it sooner than the best of hay.

Woolen goods should be washed in very hot suds, but never rinsed. Tepid water causes them to shrink.

Neglected Manures---No. 6.

From the Albany Cultivator.

Blood, Flesh, Animal Charcoal, Glue Refuse, Coal Ashes, Adulterated Manures.

Analytical Laboratory, Yale College,
New-Haven, Conn., May, 1850.

Eds. Cultivator:—In my last letter, I called attention to several powerful manures, remarkable for the large quantity of nitrogen which they contained; there are quite a number more of the same class that are valuable, and I will select two or three of them.

One of the most efficacious and energetic manures known, is to be found in flesh, of every description. Under this head, I include the blood, as that has nearly the same composition as the flesh. They both contain some 15 per cent of nitrogen: owing to this, and to the quantity of water which enters into their composition, every form of flesh and blood is strongly disposed to speedy putrefaction. This is seen in the flesh of animals, and fishes after death, especially when the temperature of the air is a little elevated.

This facility of decay, although it has its disadvantages, causes them to produce an immediate effect when applied as manures. In France, blood is dried and sold in the form of cakes; these if kept dry, will remain unchanged for a long period. The same thing may be accomplished with flesh, but only at the expense of much time and trouble. There are few farmers but have seen the remarkable effect produced by some small dead animal, when buried under a vine or young tree, or under a portion of some growing crop. It pushes the plant rapidly forward, makes its foliage luxuriant, and of a dark green, healthy color. On the field of Waterloo, the huge graves which were indiscriminately filled up with men and horses, were distinctly marked out for years, by the superior luxuriance, and the vivid green color of the grain which grew over them.

Facts tending to a similar conclusion, as to the great value of these manures, abound in almost every section of the country, and yet for the most part they are entirely neglected. If a horse, or cow, or sheep dies, it is drawn out to some lonely place, where the crows and dogs soon make way with its flesh. This is not, I am aware, true of all places; I know of some regions where they are too wise

to throw away such rich manures, where animal flesh, fish refuse, &c., is eagerly sought after; these are not, however, the majority.

I have been told of a case near the capital of one of our largest states, where the offal from the slaughter houses, was allowed to accumulate year after year, in a hollow, down the bank of which it was thrown. The farmers would not pay for it even so much as six cents per load, and many of them would not take it away for the mere expense of cartage. This mass of material would have brought from $5 to $15 per ton, in England, and would have been eagerly sought after at that price.

When manures of this kind cannot be used immediately, they should be made into compost, by mixing with large quantities of some absorbent material; if this mixture is sprinkled over with gypsum occasionally, nearly all escape of valuable substances may be prevented.

Another valuable manure, which owes much of its efficacy to blood, is to be found in the refuse animal charcoal, or bone black, of the sugar refiners. Some refiners now employ gelatinous alumina largely for purifying sugar, in place of blood, but where the latter is used, the worth of the manure is greatly increased. The use of alumina deteriorates it. Various valuable substances besides blood are present, as the impurities of the sugar, and usually some gypsum also; the animal charcoal itself is simply burned bones crushed to a powder. We have then in this refuse, an abundance of nitrogen in the blood, and of the phosphates in the bones, the two most important essentials for a good manure. It is worth $5 to $10 per ton, in England and France; in this country, it has been almost given away, so far as my experience of its use has extended.

In the yards of glue factories, a refuse accumulates, which is in England called *scutch*. It consists of variable proportions of animal matter, hair, &c., mixed with lime, this last partly as phosphate. This substance has an exceedingly offensive smell and is largely used by the farmers. It varies a good deal in its composition. Prof. Way, chemist to the Royal Ag. Society, has lately examined several samples, and considers them worth from $5 to $6 per ton. This manure then would not bear a long transportation, but would be valuable to farmers near the glue works.

The English and Scotch farmers, have in their zeal for refuse, gone in many cases to the opposite extreme; and have paid large sums for various substances because they were refuse, and seemed cheap, which turned out to be almost valueless. Prof. Way gives some instances of this kind; one of these was so remarkable that I will insert it here. It was on artificial manure or mixture, sold as admirably adapted to the turnip crop, and greatly puffed as made from cheap refuse substances of a valuable nature.—The price was nearly $40 per ton, and large quantities were disposed of. Great disappointment was experienced in its effects, and a sample was analysed by Prof. Way; his result was as follows:

Water	4.93
Sand and Clay	74.16
Organic matter	4.43
Phosphate of Lime	trace.
Oxide of Alumina	13.88
Carbonic acid	trace.
Sulphuric acid	none.
Lime	1.05
Common salt	1.62
	100.07

This, as shown by the analysis, was nothing more than a red soil, crumbled down to a tolerably fine powder, and was a most unparalelled piece of imposition. Most of the dealers, when making up such manures, add something to them which has a most offensive smell; this causes them to take with the farmers at once. They have learned that guano, animal manures, &c., have such smells, and hence conclude that all highly scented substances are fertilizers. If the dealer can succeed in imparting a most intolerable odor to his worthless mixture, he is pretty sure to find a ready sale at good prices. A man must not then, in this business, *follow his nose* too implicitly, but must call in the aid of other senses also. If a high price is to be given for a manure, it should be one of acknowledged character and value.

As concentrated fertilizers come into more general demand in this country, and as their importance becomes fully appreciated, deales will doubtless be found, who will attempt impositions of a similar character. I see already advertisements of various artificial manures; these may so far as I can say, be of good quality, but I would still urge the necessity of caution, in all cases where the dealer is not known to be honorable, or where he cannot give a sufficient guarantee as to the quality of the article that he sells.

In the preceding letters, I have indicated numerous natural manures heretofore in a great degree disregarded; some of which may, in almost every locality, be obtained without much difficulty or expense. Many of these are entirely neglected as refuse, and others can be bought for a mere trifle. I would then recommend that the farmer, before paying largely for such manures as guano, and others of the same class, look carefully about him and see if there are not to be had some such substances as I have named, that may be made available by a little exertion and perseverance, in collecting and preserving them.

There are few neighborhoods where a man who is watchful, cannot in the course of a year, collect a considerable quantity of these otherwise neglected substances. When all the farmers come to understand their true value, they will no longer permit them to leave their own land, and the supplies will of course become limited. Before their importance is generally known, those who are in favorable localities for the collection of such materials, have an opportunity of enriching their soils with comparatively a very small outlay.

I have hitherto mentioned, with the exception of bones, manures whose worth depended for the most part, on their organic portion, and on the nitrogen which this contained. There is another important class, consisting of manures wholly or chiefly inorganic, some notice of which seems necessary.

The value of wood ashes, seems now to be quite generally recognised; among those who can ever pretend to be good farmers, they are no longer neglected.—Coal ashes, however, are generally thrown away, and in the large cities immense quantities are thus wasted. We have as yet, no detailed series of analyses, from which to calculate the actual value of these ashes. Some partial investigations made in my own laboratory, show that they contain several pounds in 100, of soluble substances. These are of the same class as those which occur in wood ashes. In many places the soap makers will give a small price for these ashes, thus showing that they are able to extract some alkaline matter from them. All this, is of course valuable for the soil. I am intending to pursue the investigation of this subject on the first opporunity, and hope to lay before the community some important results.

In the mean time, I have no hesitation in saying, that these ashes will pay well for their preservation; and that it would be an object for farmers in the vicinity of cities, to send in their teams for a portion of the vast quantities which are annually thrown away.

In the course of a conversation a few days since, with a very intelligent gentleman, who has a farm near Hartford, Ct., he informed me, that according to his experience, coal ashes were worth upon his land, from one-third to one-half as much as wood ashes. This was reliable practictical evidence, and was in accordance with the views that I had previously entertained. JOHN P. NORTON.

A NEW CLOVER FOR THE SOUTH.—The Tallahassee Sentinel speaks of a Chillian Clover, sent to Governor Brown, from the Patent Office, which was carelessly sown three years ago, but which has continued flourishing and prolific ever since.

It bears a pale blue flower. and grows 18 inches high. We hope our friends in that section will watch its charaeter, and hereafter give us a full account of its merits and adaptedness to the South.

[*Am. Agriculturist.*

GOOD POINTS.—Some of the points characteristic of a good North Devon cow, are as follows:

1. She should be clear in her nose, her eyes, and her horns.
2. She should be small in her neck and fine in her shoulder.
3. She should be deep in her chest and fine in her pelt.
4. She should be straight in her back and wide in her loin.
5. She should be round on her rib, spread well at the pin.
6. She is good at the pail in quantity and quality.

Coating Iron With Glass.

From the great tendency to oxidation, and the consequent decay which iron in every shape, of rolled or wrought manufacture, has inherent in its nature, has ever been the practice to cover it with an artificial coat to preserve it from the destructive effects of the elements, and within comparatively few years past, many plans have been adopted for this purpose. Various paints and pigments, zinc, enamel for culinary utensils, and numerous other appliances, have been laid before the public, each, perhaps, good in its own way, but neither of them applicable as a universal coating for iron under all circumstances, or which will be found sufficiently economical in numerous cases.

Some specimens of iron manufacture are exhibited coated with glass, from the Smethwick Iron Works of Messrs. Selby & Johns, near Birmingham, and which appear to be the very *desideratum* so long sought for. There were three ornamental dinner plates, three pieces of iron tube, a frying pan, a piece of corrugated iron roof, all coverd with a clear, transparent glass, and which were viewed with much admiration by the visiters. In the process of coating plates, corrugated or plain roofing, tiles, tubing of all kind and dimensions, frying pans, gridirons, saucepans, kettles, cauldrons, or boilers, in lieu of coppers, and a host of other implements, domestic, agricultural and manufacturing; the article is first thoroughly cleansed in an acid solution, to free it from every particle of grease, similar to the preparation for tinning and zincing. It is then covered with a glutinous preparation, over which is laid a coat of glass ground to a fine powder.

The article is then introduced into a furnace of peculiar construction and sufficient temperature, in which the glass is fused, and the intermediate glutinous matter being evaporated, the glass fill the external pores of the metal and becomes firmly united to it, and, in answer to our enquiries, we were informed that as the manipulation became facilitated by practice, it was probable that the cost of a glass-coated iron material, of these common kinds, would be but a mere nominal trifle more than the plain articles themselves.

With respect to the ornamental articles, they of course, involve some little more complexity, but bid fair to open a field of design and novelty of much interest.—We were shown some ornamental dinner plates of the same material, each of which was four ounces lighter than an earthenware plate of the pest construction, size for size. The foliage and designs are in relief, and are executed by a kind of stencilling; one color being put on, it is transfered to the kiln and fixed; then, when cold, another color is added, again fixed and withdrawn, and so on until the design is complete. By the inspection afforded us, we have no doubt whatever, that as by practice the colors become immoved, and full command over their application obtained, this really elegant invention will be applied to numerous purposes at present scarce thought of. To washstands and toilet furniture it would be most applicable; as also for sideboards, chiffoniers, door plates and pannels, fire-grate ornaments, and numerous other purposes in decorative building and architecture. For plates for the names of streets it would be almost indestructible, and might be brought into use with much effect for shop-front architecture. We were shown among other specimens, a small door pannel, with a bunch of foliage in the centre, surrounded with an arabesque border, to represent gold, which had a very pleasing effect. The invention is another step onward in the progress of art and science, and is of much interest. *Miner's Journal.*

Professor Johnson on Animal Food.

This eminent author has been giving several interesting and valuable lectures in Boston the past season on the subject of agriculture. The following extracts are taken from the last of the series, and contain many valuable hints and suggestions which it would be well for all readers engaged in keeping and raising stock, to ponder upon:—

"Man, more than other animals, lives upon the seed of plants; for this contains more starch, gluten and oil than other parts, but less mineral matter. The former exist in different proportions in various kinds of plants, a fact which should be kept in mind in determining the kind of food to be given to different animals.—(Here a table of the ingredients of different grains and vegetable productions were exhibited.)

"Hay and grain contain fifteen parts of water; and vegetables a greater amount. Starch is found principally in the seeds of plants. Gluten is commonly found in one hundred parts of the various vegetable productions in the following proportions; in wheat from ten to nineteen, in Indian corn twelve, in buckwheat ten, in rice seven, in beans and peas twenty-four, in pea-straw twelve.

"But to decide with any degree of accuracy on what an animal should feed, it is as necessary to analyze the flesh of the animal as the vegetable prducts on which it is to feed. An animal consists of fat, lean and bone. Wash the blood out of a piece of meat and a substance, like gluten, remains called febrine. Oil in plants makes fat in animals and lubricates the parts of their bodies; mineral substances, as phosphate of lime, form the bones; so that in the animal are found substances on which it feeds.

"There is but one apparent, though not real exception to this remark. Starch which exists in the food of animals, is not found in their flesh and bones. Now if we burn the starch which exists in the food of animals, it resolves itself into water and carbonic acid gas. When their food is received into the stomach the starch passes into the system of the lungs, where by respiration, it is converted into carbonic acid gas and water, and ejected by the breath: but in the process of its reduction to these ingredients, heat, vital heat is evolved.

"If we desire to increase the growth of muscle in an animal, we must feed him with peas, beans, &c., which contain a large quantity of gluten, that formes muscle; if we must feed him with corn, oats, barley, &c., which contain a large quantity of oil, that makes fat; but if we would promote the growth of both fat and muscle, we must feed him with oil cake, which, in one hundred parts contains from twenty to thirty parts of oil, and twenty-five of gluten. Hence a skillful care of cattle requires a knowledge not only of their ingredients, but also of their various kinds of food. Such knowledge will enable the farmer to adapt his care of his cattle to the particular use which he desires to make of them.

"Other circumstances also affect their food and productiveness. Young cattle require more food than those which are full grown, because they have to supply not only the natural waste, but also the substance which promotes their growth. Animals that are shivering with cold require more food than those which are kept comfortably warm; those that work more than those that remain quiet; and those that are kept in strong light, more than such as have but little light.

If we would feed cows to obtain from them large quantities of milk, we must give them food that contains much water, as pumpkins, potatoes, and esculent roots; if so as to obtain the least quantity of milk, an article almost equal to cream, we must feed them with oily substances, as oats, barley, corn meal, &c., or so as to make them produce rich curd for cheese, we must give them peas, beans, &c., which contain much gluten, or still better, cabbage, which contains 35 pounds in one hundred of gluten.—Hence the cow cabbage is a valuable fodder in cheese making districts.

Uses of Sea Muck.

The Agriculturist for July, in an article on manures, speaks thus of the beds of sea-muck formed or forming on the shores of this country.

"There is enough of these deposits in New Jersey to fertilise no inconsiderable portion of its hungry and impoverished uplands. The same is true of most of our sea washed coasts. Millions of wealth lie buried in every marsh and stagnant pool, which needs but half the capital and energy devoted to the exhumination of California gold, to develop equal wealth and with far more certainty.

"There are various ways of compounding and applying sea or swamp muck to the soil. The simplest way, and one as generally profitable as any other, unless other fertilizing matters can be made better by the addition, is by throwing it up in heaps for partial drainage and decomposition before applying; or if the land be hungry, silicious (sandy or gravelly) soil, apply it as soon as taken out of its bed, when sufficiently dried for economical removal. The sand will seize upon this new food with avidity, and will rapidly decompose and convert it into vegetable manure. The salt in all such as is exposed to the ocean tides, will add materially to its value for manure.

"If the application is to be made to clays or adhesive lands, then the muck should undergo partial decomposition.—To effect this, several modes may be adopted. It may be most advantageously thrown into the cattle yards and pens, or privies, to absorb and become incorporated with the urine and droppings; it may receive the wash of the house, the road side, the offal from slaughter houses, melters' shops, tanneries, woolen manufactories, and the like. In this way, it becomes decomposed and every way fitted for the greatest utility; but it also acts as an absorbant, or a strong box to hoard those soluble or volatile matters that would escape into adjacent rivulets, or evaporate in the air. The value of this material, when applied in this way, is incalculable, and it should always be used to the fullest extent of its useful agency.

"But when at remote distances from the cattle yards or it is wanted in quantities much beyond what can be prepared in this way, we have found lime, (unslacked, or quick lime,) to be the most efficient decomposer of these muck beds. They are frequently filled with hard, fibrous, wiry roots and stalks, which might lie undecomposed for years in many compact soils. But when brought into contact with lime, all these and similar matters are readily converted into finely-divided manure, which is capable at once, of yielding its nutritious substance to the growing plant. This mixture may then be added to other manures or applied to any soils or crops with the utmost benefit."

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